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ABSTRACT

A report is given of the development of sets of measures with which to determine the physical fitness status and activity patterns of 10- to 17-year-old school children and youths. Three groups of physical education experts worked on the task of identifying and agreeing upon appropriate measures. The first panel determined that the most valid measures for measuring physical fitness status tested five elements: (1) cardiorespiratory endurance; (2) muscular strength; (3) muscular endurance; (4) body composition; and (5) flexibility. The second panel considered the most feasible, valid, and reliable ways to measure these elements through school-based, mass-testing programs. The third panel sought to determine items to be included in a questionnaire that could be used to monitor trends and patterns of participation in school physical education programs, public recreation programs, and participation in other physical activities. A discussion is presented of the results of each meeting, the protocols identified for administration of the measures, the rationale behind selection of the measures, and descriptions of concerns about or disagreements with the measures. The questionnaire developed to identify patterns and levels of physical activity among youth is appended. (JD)

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Office of Disease Prevention and Health Promotion

SET OF MEASURES FOR PHYSICAL FITNESS MEASURES DEVELOPMENT

REPORT NO. 11

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SET OF MEASURES
FOR
PHYSICAL FITNESS MEASURES DEVELOPMENT

REPORT NO. 11

Office of Disease Prevention and Health Promotion
Department of Health and Human Services
October 29, 1982

This report is made pursuant to Modification 14 of Contract No. 282-78-0183-DN. The persons employed by the contractor with management and Professional responsibility for the work, including the content of the report are Nancy Ostrove, Chuck Lupton, and Robert Bozzo.

Contractor:

Granville Corporation
Health and Human Services Group

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I. INTRODUCTION

This report is pursuant to Article II, Paragraph 2b. of Modification 14 to Contract No. 282-78-0183-DN. It is the final version of a document designed to provide the Office of Disease Prevention and Health Promotion (ODPHP) with three sets of measures, derived through a process of expert validation, and associated commentary, with which to measure the physical fitness status and activity patterns of schoolchildren and youth ages 10 through 17.

The three instruments (sets of measures) which are presented herein constitute the basic goals of the project. Specifically, this trifold project objective consisted of convening expert panels to:

- identify and attempt to achieve agreement about the most valid set of measures to use for determining the physical fitness status of schoolchildren and youth ages 10 through 17 as part of a normal clinical procedure
- identify and attempt to achieve agreement about the most feasible, valid, and reliable set of measures to use for determining the physical fitness status of schoolchildren and youth ages 10 to 17 through school-based mass-testing programs
- identify and attempt to achieve agreement about items to be included in a questionnaire that could be used to monitor trends and patterns of participation in physical activities by schoolchildren and youth, including participation in cardiorespiratory activities that can be carried into adulthood, participation in public recreation programs in community facilities and participation in other physical activities.

One of the initial tasks involved the identification of experts in the field of physical fitness who would together represent a balanced mixture of views on the design of the instrument to be developed. This task was accomplished through consultation with representatives of the President's Council on Physical Fitness and Sports (PCPFS) and the American Alliance for Health, Physical Education, Recreation and Dance. Specifically, those individuals responsible for identifying the experts from whom the panel members were to be selected were:

- Robert Bozzo, The Granville Corporation
- Ray Ciszek, American Alliance for Health, Physical Education, Recreation and Dance
- Glen Gilbert, Office of Disease Prevention and Health Promotion
- Ash Hayes, President's Council on Physical Fitness and Sports
- Lloyd Kolbe, Office of Disease Prevention and Health Promotion
- Nancy Ostrove, The Granville Corporation
- Glen Swengros, President's Council on Physical Fitness and Sports

This consultation resulted in a clear identification of experts who were to be asked to participate on the two panels charged with the design of the physical fitness status instruments. On the other hand, the experts to be identified for the panel charged with developing the physical activity patterns questionnaire proved more elusive. Selection of these individuals was largely complicated by the virtual dearth of extant work on this topic with persons below the age of 18, and the only slightly greater amount of literature which looked at adult physical activity patterns. In the end, members of this panel were chosen largely on the basis of their experience with fitness and recreation programs for youth in specific settings and/or their general experience in developing measures of fitness-related behavior.

The individuals so identified were contacted, informed about the purpose of the relevant panel meeting, and invited to attend. Five of the eight persons identified for the first panel and five of the seven selected for the second panel were able to arrange their schedules so as to permit their attendance. The panel members are identified in sections to follow, which describe the results of the meetings.

The two panels discussing physical fitness status measures were each scheduled for one and one half days; the panel concerned with the physical activity patterns questionnaire met for one day. In all cases, in addition to the experts convened, the panels included representatives from the Office of Disease Prevention and Health Promotion, the President's Council on Physical Fitness and Sports, the American Alliance for Health, Physical Education, Recreation and Dance, and The Granville Corporation.

The remainder of this report consists of a discussion of the results of each meeting, including the measures selected for inclusion in the respective instruments, the protocols identified for administration of the measures where appropriate, the rationale behind selection of the measures, and descriptions of any identified concerns or disagreements about the measures which may have arisen in the course of the meetings. In addition, concerns raised by experts, selected by the panel members, who reviewed draft versions of the respective individual chapters of this document have been included in the relevant chapters.

II. PANEL I

INTRODUCTION

A panel of experts in the field of physical fitness was convened on September 16 and 17, 1982 in Washington, D.C. to identify and attempt to achieve agreement about the most valid set of measures to use for determining the physical fitness status of schoolchildren and youth ages 10 through 17 as part of a normal clinical procedure.

The panel was the first assembled under a contract from the Office of Disease Prevention and Health Promotion (ODPHP) to The Granville Corporation to identify current thinking about the assessment of the physical fitness status and activity patterns of children and adolescents. The individuals participating in the panel discussion were:

- David Clarke; Chairman, Department of Physical Education, Indiana University
- Samuel Fox, III; Director, Cardiology Exercise Program, Georgetown University Hospital
- Marigold Edwards; Associate Professor of Education, University of Pittsburgh
- Michael Pollock; Director, Cardiac Rehabilitation and Center for Evaluation of Human Performance, Cardiovascular Disease Center, Mt. Sinai Medical Center, Milwaukee, Wisconsin
- Christine Wells; Professor, Department of Health and Physical Education, Arizona State University.

Also included were Lloyd Kolbe and Glen Gilbert as liaisons from the Ofice of Disease Prevention and Health Promotion, PHS, DHHS, Ash Hayes as liaison from the President's Council on Physical Fitness and Sports, Ray Ciszek as liaison from the American Alliance for Health, Physical Education, Recreation and Dance, and Nancy Ostrove and Robert Bozzo from The Granville Corporation.

Following dissemination to all panel members and selected outside reviewers of a draft write-up relating the process involved and the conclusions

reached by the panel, feedback was solicited and incorporated into the write-up. The outside reviewers who contributed to this effort were:

- Tom Gilliam; President, Gilliam Enterprises, Twinsburg, Ohio
- Sharon Plowman; Professor, Department of Physical Education, Northern Illinois University
- William Strong; Chief, Pediatric Cardiology, Medical College of Georgia
- Jack Wilmore; Professor, Department of Physical Education, University of Arizona.

PHYSICAL FITNESS COMPONENTS AND MEASURES

The first order of business was to review the rationale and purpose behind the panel discussion. This process of review and clarification served to place the objective of the panel within the context of providing a solid foundation upon which a field instrument could be based, which will be used in a survey of schoolchildren and youth ages 10 through 17 to be conducted in the 1982-83 school year, under the auspices of ODPHP.

Following this clarification of the background and purpose of the panel to the panel members, a discussion ensued which revolved around the issue of what elements should be considered as constituting the concept of physical fitness. This relatively lengthy discussion covered the pros and cons of the two most currently acceptable perspectives on physical fitness—i.e., the performance and health related perspectives. The perspective adopted by the group, which was partly predicated on the requirements of the Physical Fitness Objectives for the Nation, and the ODPHP sponsorship of the effort, included the relationship of physical fitness both to health and to physical performance. The five elements finally agreed upon were based on the notion that performance measures need not be explicit tests of skills but instead may be measures of more generic underlying features which provide the basis for adequate performance. However, one view expressed was that the components selected, and the measures eventually chosen, represented too narrow a definition of physical fitness and do not adequately reflect the performance orientation. The final consensus reached included the following five elements (not ranked):

- cardiorespiratory endurance
- muscular strength
- muscular endurance
- body composition
- flexibility.

Additional components which were considered by the group but not included in the final determination were: agility; balance; power; coordination; and posture.

Early in the discussion of the most appropriate measures to use in assessing individuals' standing with regard to these components, it was decided that the available measures could be conceptualized with regard to how accurately they reflect the components selected, especially with regard to control over sources of undesired variation. One of the ODPHP representatives has noted that he conceptualizes the levels of measurement as denoting successfully lower levels of validity; however, the validity represented by the measures within each level was not a topic of the panel discussion itself. The reason for specifying a range of measures was to accommodate testing situations in which the most complex measures might not be practical. Therefore, for each of the components of physical fitness, three different levels of measurement were identified, all of which contained measures believed to be relevant and important enough to be considered by the panel. The first level represented the optimal, state-of-the-art measures which would be used in laboratory or clinical research revolving around the identified element. The second level represented a more pragmatic view within which measures were identified which could more feasibly be carried out within the less extensively equipped clinical setting of a physician's office or that of a specialist in assessing individual fitness status. The third level took into account the most practical constraints, i.e., situations where only minimal equipment would be available, where children would be tested en masse and where testing would be accomplished within the capacity and jurisdiction of schools. In all cases, an attempt was made to identify measures at each successively lower level of measurement which were highly related to those at the highest level.

At this point, we also need to acknowledge an issue which arose in the second panel meeting (and thus will be addressed more thoroughly in Chapter III) but was also endorsed by one of the reviewers of the first panel write-up. This relates to the issue of the age of the examinee. Specifically, it was noted that there is a significant deficiency in the extant knowledge about

the fitness of five to nine year old children; the reviewer in question felt that the project's inability to speak to this issue constituted a definite shortcoming.

Cardiorespiratory Endurance

Level 1. The members of the panel agreed that the most ideal procedure to use in assessing cardiorespiratory endurance would be a symptom limited, graded exercise test with monitoring and assessment of maximal oxygen uptake. However, a number of acceptable protocols were identified within that general procedure. These are listed below in order of the preference accorded them. However, two of the outside reviewers cautioned that modification to any protocol chosen might be necessary, especially with younger children. It was also noted that protocols for children are available from Tom Gilliam and in Wilmore and McNamara (1974).

(1) Collection of blood pressure, oxygen uptake and ECG and heart rate measures with or without cardiac output

(a) utilizing a treadmill and any one of the following protocols (not ranked)

- Balke
- Bruce
- Naughton

(b) utilizing a bicycle ergometer and the Åstrand protocol and specifying work output

(2) Collection of blood pressure, heart rate, and ECG measures with estimation of $\dot{V}O_2$ max utilizing either a treadmill or bicycle ergometer.

Level 2. The panel members were particularly reticent to recommend the direct measurement of oxygen uptake in a physician's office for routine examinations. Specifically, they did not want to recommend procedures that would contribute to increased costs. They felt that referrals could always be made to fitness testing specialists should there be a clear indication of individual need. Especially where there is limited access to a treadmill and where $\dot{V}O_2$ max must be estimated, more indirect means of measuring CR endurance may be used. For measurement of functional capacity, the panel recommended use of a bicycle or bench (step test) with monitoring of heart rate during the test

and/or during recovery, leading to estimated $\dot{V}O_2$ max. They suggested ECG usage, use of stethoscope or palpation for heart rate monitoring. A test often used at this level is a submaximal bicycle test with monitoring of heart rate and extrapolation to the prediction of $\dot{V}O_2$ max. Both the Åstrand procedure and the procedure described in the Y's Way to Physical Fitness are acceptable. It should also be noted that there is about ten percent error in the prediction of $\dot{V}O_2$ max utilizing this kind of submaximal procedure.

Level 3. For the lowest level of systematic assessment—i.e., field testing—the suggested test for assessment of CR endurance was "the run." Specifically, this would involve either having the individual run a specified distance (e.g., 1.0 or 1.5 miles, depending on the age of the subject) and measuring time elapsed, or having the individual run for a specified period of time (e.g., 9 or 12 minutes, depending on age) and measuring the distance covered.

Should this procedure be infeasible, a suggestion was made that bench stepping (to a specified cadence) could be used. However, the general feeling was that this particular procedure is not necessarily a valid test of CR endurance.

In addition, concern for the reliability and validity of the run was expressed, especially with regard to motivational and pacing problems with children. That is, should the respondent not be willing to expend a sufficient amount of effort, his or her score will not be a good indicator of CR endurance nor will it be comparable with scores of those who do expend the required effort. Similarly, children who have received the requisite knowledge and practice at pacing themselves will produce more valid and reliable measures than those lacking such knowledge and practice.

In agreement with the caveat discussed above, the reviewer who expressed concern for the limited age group to be assessed also noted that, for children under ten, boredom would constitute a problem in use of the 9 or 12 minute runs; he recommended the six hundred yard run for time as better suited to the 6-9 age groups.

Finally, another reviewer did not agree that the runs were equally acceptable. He felt that children respond better to a timed run for distance (i.e., the 9 or 12 minute run) than they do to a measured run for time (either the 1.0 or 1.5 mile run).

Body Composition

Level 1. Agreement concerning the state-of-the-art measurement technique for assessment of body composition was reached fairly rapidly. After a brief discussion of other techniques, hydrostatic (underwater) weighing was identified as the optimal technique in current use which would provide valid measures of percent body fat. With regard to this technique, a number of methods for determining residual volume were considered to be reasonable, including helium dilution, nitrogen wash-out and oxygen dilution. However, this procedure is accurate for adults only. Assumptions made about bone, fat, and muscle density in utilizing the conversion equations are not necessarily valid with children in the 10-17 age group because of the growth they are undergoing at that time. In addition, the procedure is difficult even for some adults and was mentioned by one of the outside reviewers as being particularly difficult to administer to children.

Level 2. At the outset, it should be noted that the difference between level 2 and 3 measurements was not considered to be as clear in the assessment of body composition as was the case for the evaluation of CR endurance. In general, it can be said that the difference between these two levels lies in the number of measurements taken and the quality of the instrument rather than in any qualitative difference in measurement technique. Also, calculation of percent body fat from the measures which can be used at Levels 2 and 3 was not recommended, for the same reasons as were discussed above regarding the inaccuracy of conversion from hydrostatic weighing results. Therefore, the use of a sum of skinfolds measurement was recommended at Level 2--between 5 and 7 sites were suggested for measurement, including:

- triceps
- subscapular
- suprailiac
- chest
- axilla
- abdomen
- front thigh.

There was some uncertainty expressed concerning the front thigh measure. It was considered to be a good predictor of body fat for women, but not as good for children and athletes.

Although some discussion of girth measures took place, especially flexed and tensed upper arm girth, there was no general consensus reached regarding how this measure could be used. Interest was expressed in seeing girth measures used in the future, possibly as independent measures of leanness not related to body fat. In contrast, one outside reviewer felt that girth measures were more reliable, and hence more useful, than skinfold measures, while another reviewer felt that "eyeball" measurement provides as good an assessment of body composition as any other method presently available.

Level 3. Again, sum of skinfolds was suggested as the measure for use at the field testing level. The subscapular and triceps sites were recommended if only two sites were to be measured because of their relatively high inter-rater reliability as well as because of the amount of data presently available which utilize these two sites. The suprailiac was recommended if a third site could be added.

Muscular Strength

General Comments. At the outset of the discussion of this component, the panel members noted that measurement of muscular strength, although important, is somewhat problematic because even the best technology does not provide very good measures. In fact, they recommended treating muscular strength and endurance as a combined component for measurement below Level 1. In fact, one of the outside reviewers felt that there was no need to separate them at any level.

Another measurement issue which was considered especially relevant to Level 1 assessment but also was a theme running through the strength/endurance discussion revolved around whether the measurement was isotonic, isometric, or isokinetic. These will be discussed separately wherever appropriate.

Level 1. As noted above, the panel members admitted that even the state-of-the-art techniques for assessing muscular strength are still not perfect. However, they were willing to specify two "ideal" methods for muscle strength measurement at this level, and a third considered somewhat less than

ideal. The major muscle groups suggested for testing included those of the shoulder, arm, trunk, and legs. However, it was also noted that hip and trunk assessment were considered to be too difficult to accomplish.

Utilization of a cable tensiometer was recommended for isometric measurement, with assessment of: shoulder extension; knee extension; and ankle plantar flexion. These are demonstrated in the Oregon Cable-Tension Strength Test Batteries (Clarke and Monroe, 1970). It was also noted that valid use of this technique depends on the skill of the administrator.

Isokinetic assessment is accomplished with use of a constant speed accommodating resistance machine (e.g., the CYBEX II). It should include: knee extension and flexion; elbow extension and flexion; and shoulder extension and flexion. However, at least one panel member expressed some uncertainty about what this technique actually measures with regard to fitness.

Finally, isotonic assessment of the muscle groups listed above can be accomplished through the use of free weights.

Levels 2 and 3. Separation of the elements of muscular strength and muscular endurance becomes extremely problematic at levels of measurement below that of the laboratory, which itself, as already mentioned, is considered less than ideal. Therefore, in addition to grouping levels 2 and 3, the panel members recommended that individuals considering field level measurement of strength and endurance combine them. The suggested combination measures will be discussed in the section on muscular endurance immediately below.

Nonetheless, if equipment is available, the panel members recommended the use of a 1 RM (rep max) bench press for measurement of strength--which correlates well with the results for other muscle groups--and, secondarily, a 1 RM biceps curl. Also, use of the leg press and knee extension (utilizing a boot) was mentioned. However, one of the reviewers pointed out that demand of this kind of all-out effort could be a very dangerous technique to use with children and would not encourage its use.

Additional Concerns. Two other issues were discussed which, although considered general issues as well, were especially relevant to the measurement of strength. Specifically, it was noted that a problem exists in the utilization of some weight machines (e.g., Universal) with some women and children

because their smaller stature requires that modifications be made when they are fit into spaces designed for use by men. That is, except for some recent attempts (e.g., by Nautilus) there is a lack of standardized equipment for children and women. A related issue revolves around the need to check and recalibrate all strength-testing equipment on a fairly regular basis; note was made that equipment often is not calibrated correctly even when it comes straight from the factory, and in any case needs to be checked for slippage with use.

Muscular Endurance

Level 1. The utilization of fatigue curves for assessment of the same muscle groups as suggested for strength testing--i.e., shoulder/arm, knee (legs) and trunk/hips--was recommended. Two types of equipment were discussed. The use of a weight-loaded ergometer, providing an indication of isotonic endurance, constituted one possible technique, but the question was raised concerning how to determine the weight to be used; too little would not lead to fatigue, while too much would cause fatigue too rapidly to provide a valid assessment. General agreement ws reached that a spring-loaded ergometer (or strain gauge), measuring time to 50 percent reduction from rhythmic contractions, would constitute the recommended technique.

Level 2. Two potential procedures were suggested for measurement of endurance at this level. One procedure involves assessment of the amount of weight which can be dealt with at 15 RMs utilizing the: bench press, curl, leg press, and knee extension. The second procedure would involve measurement of the number of repetitions of a fixed weight (determined individually for each examinee) in a fixed time (e.g., 30 seconds). However, some concern was expressed that this latter procedure is more dangerous than the former, and is also more likely to measure anaerobic power rather than endurance.

Level 3. Recall that at this level the recommendation was made that muscular endurance be combined with muscular strength. Therefore, the field tests suggested are not indicative of either one or the other but instead constitute an index of muscular strength and endurance.

For the abdominal muscles and hip flexors, timed bent-leg sit-ups (60 seconds) were unanimously recommended. Also suggested was that they be called curl-ups for educational purposes so as to increase awareness of the form which should be used.

Two questions were raised with regard to the sit-ups being timed. One, discussed by the group, dealt with the time selected. Although timing for 30 seconds was considered, it was rejected because many felt that 30 seconds is not enough time to demonstrate any kind of slowing down for many students; therefore, an artificial "ceiling" would be created, and children at the high end of the distribution would not be distinguishable from each other. The second question, brought up by one of the outside reviewers, related to the advisability of timing the children at all. He felt that using a limit reduces the validity of the measure for abdominal assessment by creating a situation where the child performs the movement improperly. The recommendation of this reviewer was that the sit-ups be done in a controlled, paced manner toward the maximum number performed.

Following lengthy discussion, it was decided that the best way of assessing the arm and shoulder girdle muscle group was with the use of pull-ups or the flexed-arm hang. Despite the apparent fact that pull-ups put at a disadvantage individuals with certain body characteristics (e.g., long arms, heavy lower body), the logistical problems of administering push-ups (the clearest alternative) overshadowed the limitations of pull-ups. However, it was also recommended that the same procedure be used both for boys and girls. Specifically, all children should try to do pull-ups and only if one pull-up could not be performed should the flexed-arm hang be utilized.

Finally, an attempt was made to identify a strength-endurance test for the leg area. Although leg raises were rejected because of the strain put on the lower back, two other possibilities were mentioned. One was squat-thrusts and the other was wall-sitting time. Concern about the potential for injury made squat thrusts an undesirable technique, and too little is known about the validity of wall-sitting for it to be included at this point. In addition, two of the outside reviewers noted that a jumping/hopping test could be considered for assessing this muscle group on a field basis. However, it was pointed out that unless the examinee was required to clear an object, and not just lift his or her body off the ground, the test would assess endurance only—not strength. In addition, one other outside reviewer saw little value in assessing this muscle group separately and felt that running or biking as part of a CR measure would provide an excellent measure of leg endurance.

Flexibility

Level 1. Use of an electrogoniometer or flexometer was recommended as the state-of-the-art procedure for assessment of flexibility. It was also noted however, that correlations of flexibility between different joints are very low and therefore ideally each joint would have to be assessed separately.

Levels 2 and 3. Given the above-mentioned lack of association between the flexibility of different joints, it was decided that it is most important to assess the flexibility of the back extensors and hamstrings. It was unanimously agreed that this could best be accomplished through use of the sit-and-reach procedure. In fact, the panel members felt that the sit-and-reach procedure was relevant for all three levels. The panel members also felt that assessment of the arm and shoulder area and of ankle flexion/extension would be useful, but did not reach agreement about any extant procedures. The panel members also specified that examinees should be required to warm up before attempting the sit-and-reach for actual scoring purposes.

Final Concerns

Subsequent to the discussion summarized above, brief consideration was given to other measures--especially field measures--which might reflect certain of the possible elements of fitness which were identified but not pursued. There was agreement that a need existed to look into the operation of integrative functions such as neurologic and musculo-skeletal coordination, including balance, reaction time, etc., and how such functions are related to the performance of lifetime sports and other activities. Additionally, at least one individual expressed concern with the issue of encouraging people to learn how to "turn off" as well as "turn on" their muscles, i.e., the issue of relaxation as a component of physical fitness.

III. PANEL II

INTRODUCTION

A second panel of experts from the field of physical fitness was convened on September 27 and 28, 1982 in Washington, D.C. to identify and attempt to achieve agreement about the most feasible, valid, and reliable set of measures to use for determining the physical fitness status of school-children and youth ages 10 to 17 through school-based mass-testing programs.

The panel was the second assembled under a contract from the Office of Disease Prevention and Health Promotion (ODPHP) to The Granville Corporation to identify current thinking about the assessment of the physical fitness status and activity patterns of children and adolescents. The initial panel had been charged with the goal of selecting the most valid set of measures for use with the identified population within the context of a normal clinical procedure; the results from this panel are described more thoroughly in the preceding chapter.

The invited individuals participating in the second panel discussion were:

- Lee Allsbrook; Elementary Physical Education Specialist, Middle Tennessee State University
- Harold Lakey; Supervisor, Health and Physical Education Service, Virginia Department of Education
- Doris McHugh; Physical Education Consultant, Huntsville City Schools
- Robert Pangrazi; Chairman, Physical Education, Arizona State University
- Guy Reiff; Professor, Department of Physical Education, University of Michigan, Ann Arbor

Also present were Lloyd Kolbe and Glen Gilbert as liaisons from the Office of Disease Prevention and Health Promotion, PHS, DHHS, Ray Ciszek as liaison from

the American Alliance for Health, Physical Education, Recreation and Dance, Ash Hayes as liaison from the President's Council on Physical Fitness and Sports, and Nancy Ostrove and Chuck Lupton from The Granville Corporation.

Following dissemination to all panel members and selected outside reviewers of a draft write-up relating the process involved and the conclusions reached by the panel, feedback was solicited and incorporated into the write-up. The outside reviewers who contributed to this effort were:

- Joseph Carr; Advisor, Health and Physical Education, Pennsylvania Department of Education
- Betty Hennessy; Physical Education Consultant, Los Angeles County Schools, California
- Cam Kerst; Physical Education Consultant, Takoma Public Schools, Washington
- Gene Peterson; Supervisor, Physical Education, Mesa Public Schools, Arizona
- Charles Sterling; Director of Research, Aerobic Center, Dallas, Texas.

INITIAL CONCERNS

The first order of business was to review the rationale and purpose behind the panel discussion as well as to provide an overview of the relevant results of the panel meeting conducted prior to the present one. This process of review and clarification was quite extensive in that it provided the foundation upon which the remainder of the discussion would be based; the entire first meeting (the evening of September 27) was devoted to it. This process resulted in the clarification of the objective of the current meeting as being the development of a measurement instrument for a survey of schoolchildren and youth ages 10 through 17 to be conducted in the 1982-83 school year under the auspices of ODPHP.

During the course of clarifying this objective, several questions were raised which covered a broad range of concerns. These questions were concerned with such issues as:

- the ultimate use to which the instrument is to be put
- the relationship of the proposed instrument to those currently in use (specifically AAHPERD's Youth Fitness Test and Health Related Physical Fitness Test)
- whether the individuals who will be administering the measures will receive special training
- what inputs should be considered regarding feasibility (e.g., time to administer, attitudes of teachers and students, equipment)
- when the instrument is scheduled to be administered.

At least some of the panel members suggested that a "new" set of measures may not be the most feasible with which to accomplish the specific Objective for the Nation concerning the participation of at least 70% of schoolchildren and youth in a systematic assessment of their physical fitness, since, in many cases, local education departments have already institutionalized one of the other two tests. Related to this was the concern that the proposed test not be perceived as a third test to compete with AAHPERD's other two testing instruments. Congruent with the objective identified regarding the imminent use of the instrument, the panel members were assured that the continued use of either of AAHPERD's established tests would not be affected by any conclusions reached by this panel.

In addition, regardless of the fact that the population with which the survey will be concerned had been specified a priori, the panel members strongly recommended that the instrument be constructed and assessments be conducted for the total range of schoolchildren and youth grades K through 12, and that a strong recommendation be made that the arbitrary cut-off at age 10 was an indefensible one. The assembled experts felt that this feature of the effort implies that fitness is not important for children under 10 years and also tends to construct a psychological barrier toward evaluation of the younger age groups by setting the experts' "stamp of approval" upon the limited parameter. One of the members with extensive experience in testing children as young as six felt that they can be assessed given the appropriate instructions and care.

In general, the panel members also concurred with the previous panel's selection of those elements which should be considered integral to a determination of physical fitness status. As specified earlier, these were:

- cardiorespiratory endurance
- body composition
- muscular strength
- muscular endurance
- flexibility.

However, one person expressed concern that these components, and the tests eventually selected, indicated acceptance of a narrow definition of physical fitness which does not adequately express the performance—as opposed to the health—aspects of physical fitness.

As the process of measurement selection progressed, three further issues were identified as being of sufficient value to warrant special mention. Specifically, it was noted that evaluation of the physical fitness of students is a sensitive procedure, and that all possible efforts should be made to reduce any potential trauma or embarrassment which could be experienced by students as a function of low performance or other considerations such as physical appearance. One instance where this caution was considered especially relevant was in relation to the assessment of body composition, where a screened off area for individuals or small groups of students was suggested to enable measurement in relative privacy, and reduce potential trauma for susceptible students.

A second general caution was sounded with regard to the legitimate and illegitimate uses to which the derived instrument could be put. The group assembled wanted to specify that the tendency for teachers to use individual scores for determination of a child's grade should be strongly discouraged.

The third issue dealt with the specification of optional measures. The panel members felt that this practice should not be utilized for the current purpose because it could result in inadequate sample sizes and tends to create excessive confusion.

These issues will be expanded upon or added to where such discussion is appropriate in the following description of individual test item selection. It should also be noted that the order in which the different components were covered followed that utilized by the first panel and was purely arbitrary.

Cardiorespiratory Endurance

An extensive discussion ensued of the differential feasibility of utilizing a timed run for distance or a measured course for time for assessment of cardiorespiratory endurance. The following describes some of the intermediate issues that entered into the selection of the most appropriate measure.

- The possibility of providing options (e.g., as in AAHPERD's Health Related Physical Fitness Test) was not endorsed, both for statistical reasons of providing groups too small for precise analyses, and conceptual/logistical reasons such as encouraging artificial age or sex dichotomies and clouding the issues
- The timed run for distance was judged to be harder to administer than the measured run for time
- Some felt that people have an easier time "relating to" or understanding the meaning associated with the time in which one can run a measured distance (especially 1.0 mile) as opposed to the distance one can run in a measured amount of time
- Some felt that it was harder to "sell" the run for distance compared to the run for time, but others felt that it has become easier to "sell" the mile run
- Concern was also expressed for the possibility of a high non-response rate for the 1.0 mile run. This particular issue was especially related to calling the task a "run" and is alleviated somewhat by the terminology change discussed immediately below.

In conclusion, it was decided that any advantages associated with the run for distance were outweighed by the problems associated with its administrative and public relations aspects. The final recommendation was that the 1.0 mile test for time be considered the most feasible item for evaluating cardiorespiratory endurance in a school-based, mass-testing situation. It should also be noted that the terminology suggested for describing the test item be the "1.0 mile jog/walk", and that the age group which could be tested with this item include 6 through 17 year olds. The recommended terminology change was suggested to minimize the apprehension felt by some parents regarding their expectation that their child would be required to run the entire mile.

Some concerns were raised by reviewers regarding the choice of the 1.0 mile run. Although there was general agreement that it was probably the most feasible to "sell" and administer, a couple of reviewers expressed concern about administration to children as young as six. Another reviewer felt that school teachers should be made aware of the fact that there are other options available to them as teachers for assessing cardiorespiratory endurance--specifically that the 9 and 12 minute runs provide an assessment and challenge to the student that is more nearly the same across age groups than the 1 0 or 1 5 mile run for time.

Considerations related to how the course should be laid out resulted in the following.

- Motorcycle and car odometers should not be used if at all possible in laying out a course; they do not result in accurate distance measurement
- Many police stations have accurately calibrated wheels they use in taking measures for accident reports which they would most likely be pleased to lend, especially if they could get some free favorable publicity. In addition, measuring wheels can be inexpensively purchased at some athletic equipment stores.

Finally, two further notes were made in the course of the review of the panel results. One concerned the need to be aware of the effect of running surfaces on obtained scores and thus to use similar surfaces whenever possible. The second was a recommendation by one reviewer that a 220 yard oval be used at the elementary school levels should a 440 be infeasible.

Body Composition

The discussion of body composition measures was not as lengthy as that concerning CR endurance, largely because there were fewer acceptable options to be considered. At the outset, it should be noted that the issue of individual sensitivity was considered especially relevant with regard to measurement of body composition; in fact, it was at this point that the suggestion was made that a general statement concerning the sensitive aspects of testing be included in this report. In addition to the suggestion that use of a screened-off area be considered, a brief discussion of other past parental concerns led to the suggestion that female examiners be utilized when necessary for assessing the body composition of female students.

After debating the relative advantages and disadvantages of collecting only a triceps skinfold measure versus collecting both triceps and subscapular measures, it was recommended that both be measured.

A discussion of the problems associated with the calculation of percent body fat from skinfold measures resulted in the general conclusion that some interpretation of what the skinfold measure represents should be more clearly included in the protocol for that measure. It was recommended that a relatively rough interpretation be offered which translates the sum-of-skinfolds measure into a three level classification of body composition: acceptable (lean), marginal and "undesirable" (obese). The cut-off points for these determinations would be decided upon as a function of age, the distributions obtained, and professional consultation.

In addition to specifying the use of a measure from each site, the panel members recommended that the measures be collected by use of an acceptable spring-loaded plastic skinfold caliper similar to the Slimguide, and that the calipers be left at the school, subsequent to testing, as a good will gesture. The decision to recommend use of plastic calipers was made on the basis of their cost, accuracy, and durability relative to the considerably more expensive and delicate Lange or Harpenden skinfold calipers. Subsequent consultation with Tim Lohman, who has been investigating the various plastic calipers on the market, resulted in the identification of a second caliper, in addition to the Slimguide--but not spring-loaded--which shows acceptable correlations with the more expensive instruments. This caliper--the Adipometer--costs less than the Slimguide but was also judged to be less durable. He specifically stated that he would not recommend use of the Fat-o-Meter because of weak spring tension and consequent unreliable readings.

Aside from the substitution of an acceptably accurate plastic skinfold caliper, the protocol recommended for measurement of body composition is described in AAHPERD's Health Related Physical Fitness Test Manual. However, a caution was sounded by more than one individual with regard to standardization. It was pointed out that the largest source of variation in skinfold measurement is the examiner, with the instrument itself accounting for less variation. Specifically, the recommendation was strongly made that examiners be trained in a standardized fashion by an expert, especially with regard to locating the site to be measured and holding the skinfold for measurement, and

that all examiners use the same brand of caliper (either the Slimguide or the Adipometer) on which they were trained.

Muscular Strength and Endurance

The current panel members agreed with the conclusion of the first panel that it would be infeasible to attempt to measure separately muscular strength and endurance in a field setting. Therefore, these components of physical fitness are considered together. Following fairly rapid consensus regarding the recommendation for a measure of abdominal strength/endurance, a lengthy discussion ensued of the advantages and disadvantages of the measures to assess upper body strength/endurance.

Sit-ups. Agreement was reached fairly rapidly concerning the appropriate test to use for assessing the strength and endurance of the abdominal area. The consensus was that timed bent-leg sit-ups constituted the preferred measure. In general, it was felt that the Health Related Physical Fitness Test Manual provides the best protocol, with the following clarifications.

- It was decided that individuals' heels should be placed no more than twelve (12) inches from their buttocks (following the description in AAHPERD's Youth Fitness Test Manual; 1976 Ed.)
- Instructions to teachers and students should make it clear that the individuals being examined should return to the down position only as far as their shoulder blades touching the mat. It was felt that the "mid-back" terminology used in the manual was too vague.

Pull-ups/Flexed-Arm Hang. The issue of what measure should be used to assess upper body (upper arm/shoulder girdle) strength and endurance proved to be somewhat more complex than the process involved for the selection of a measure of abdominal strength/endurance. Conceptual, statistical and logistical concerns were expressed and discussed. One issue discussed revolved around the extremely skewed distribution resulting from the pull-up measure, which precludes statistical comparison of this measure with other measures of fitness. Compared with the flexed-arm hang, the more traditional (at least for boys) and more often utilized (in adult fitness assessment) pull-up measure was considered to be:

- less sensitive to individual differences in general because of the significant minority of boys (between 10 and 30% depending on age) who cannot perform even one pull-up
- less sensitive to improvement
- more disadvantageous toward individuals possessing long arms and/or heavy body mass.

In addition, it was noted that different types of strength were being assessed by the two techniques; pull-ups measure isotonic, dynamic strength, whereas the flexed-arm hang is more of an isometric, static measure. The assembled members were unwilling to assert that one versus the other type was more or less important to a determination of upper body fitness status. In contrast, one of the outside reviewers questioned the value of measuring both, asserting that the flexed-arm hang generally provides the same indication of upper body strength as the pull-up, without the attendant problem of non-performance for a large minority of the population in question. A second reviewer was also hesitant about the use of both tests, asserting that obese children cannot do either and that administration in a mass-testing situation is likely to be problematic because of limited equipment (chinning bars). The other three outside reviewers felt that the use of both tests was a good idea.

Two further concerns which entered into the final decision were that:

- the rationale for using different tests for boys and girls (as is the case for the Youth Fitness Test) is no longer an easy one to justify
- using the flexed-arm hang only as an alternate when the examinee fails to perform one pull-up is both statistically awkward and administratively inconsistent.

The ultimate result of examination of these issues was that both the pull-up and the flexed-arm hang measures were recommended for inclusion in the test battery for both girls and boys. It was also specified that the tests be given over two days with the flexed-arm hang administered first and the pull-up test given on the second day of testing. Two additional considerations were raised concerning administration of these measures. One panel member pointed out that hot weather testing with slippery portable chinning bars could be problematic; sweating can result in unintentional movement which can affect adversely the score obtained. Also, one of the reviewers requested

that it be made clear that the overhand grasp or forward grip—not a reverse grip—be used for both tests. The panel members were also clear on this point. The Youth Fitness Test Manual describes the recommended procedures for administration, except for the above mentioned specification that both items be used for the entire population tested.

Flexibility

The consensus of the panel was reached fairly rapidly and was almost identical to that reached by the first panel with regard to the assessment of flexibility. In other words, they clearly sanctioned the use of the sit-and-reach test as described in the Health Related Physical Fitness Test Manual. A brief discussion concerning how to provide a rationale for inclusion of flexibility as an aspect of physical fitness resulted in several suggestions including:

- the need to educate individuals regarding the range of behaviors appropriate to physical fitness
- the proposed relationship of flexibility (especially of the lower back) to low back pain in adulthood
- the relationship of flexibility to agility and its influence on the performance of various sports and exercises
- the importance of flexibility in ensuring the safety of the individual, especially with regard to risking injury or accidents while performing various activities.

In addition, some panel members and outside reviewers endorsed the recommendation that emphasis should be placed on using a slow, non-bouncing movement in accomplishing the stretch. Some concern was expressed that the Health Related Physical Fitness Manual was not sufficiently clear in its instructions for test administration, and that a bouncing movement could be inferred from the description. The need for standardized procedures, including close inspection for consistency of the equipment utilized, was stressed.

SUMMARY AND ADMINISTRATIVE CONCERNS

In summary, a total of six measures were recommended for inclusion in an instrument designed for a school-based mass-testing procedure for determining the physical fitness status of schoolchildren and youth; these measures encompassed five components of physical fitness. Exhibit 1 below summarizes the components, measures, and recommended protocols. In addition, the panel members felt that the test would need two hours for administration, and would therefore take between two and four days to administer (depending on the length of the class period involved). They also recommended that the 1.0 mile jog/walk be given on the last day of testing and, as mentioned previously, the flexed-arm hang be administered prior to the pull-up measure by at least a day. However, one outside reviewer stated that there was no necessity for administering the jog/walk on the second day as long as the children are given clear instructions on what to expect. He felt that the jog/walk was not more likely to cause attrition than any of the other measures, and therefore, although it should be administered separately, could be done on either day.

EXHIBIT 1

MEASURES AND PROTOCOLS FOR
SELECTED PHYSICAL FITNESS COMPONENTS

PHYSICAL FITNESS COMPONENT	MEASURE	PROTOCOL	EXCEPTIONS/CLARIFICATIONS TO PROTOCOL
Cardiorespiratory Endurance	1.0 mile jog/walk	Health Related Fitness Test	
Body Composition	sum of skinfolds: triceps and subscapular	Health Related Fitness Test	
Muscular Strength and Endurance			
1. abdominal area	1. timed sit-ups	Health Related Fitness Test	1. feet no more than 12" from buttocks 2. down position to shoulder blades
2. upper arm/shoulder girdle	2a. pull-ups 2b. flexed-arm hang	Youth Fitness Test (1976 edition)	Both tests given to both boys and girls
Flexibility	Sit-and-reach	Health Related	importance of steady (non-bouncing) stretches emphasized

IV. PANEL III

INTRODUCTION

A third panel of experts, representing a wide range of perspectives, was convened on October 13, 1982 in Washington, D.C. to identify and attempt to achieve agreement about items to be included in a questionnaire that could be used to monitor trends and patterns of participation in physical activities by schoolchildren and youth, including participation in school physical education programs, participation in public recreation programs in community facilities and participation in other physical activities.

This panel was the third assembled under a contract from the Office of Disease Prevention and Health Promotion (ODPHP) to The Granville Corporation to identify current thinking about the assessment of the physical fitness status and activity patterns of children and adolescents.

Individuals participating in this third panel discussion represented a relatively broad range of expertise, especially as compared with those selected for the two panels discussed in previous chapters. Because the task to be addressed in the discussion was to develop a questionnaire which could be administered to children as young as 10 years of age, and as old as 17, both Granville and the Project Officer deemed it reasonable to include individuals familiar with questionnaire construction and development, and those familiar with the abilities of the age groups, as well as individuals representing the views of groups familiar with school physical education and public recreation programs. Because the contract had awarded to the firm which would be conducting the survey for which the measures were being designed, representatives from that firm were also invited. Finally, Granville's extensive previous experience with the critical analysis of extant physical activity pattern questionnaires, as well as its representatives' experience in questionnaire construction, ensured the active participation of its represent[illegible]
also proved invaluable in the development of a draft ins
the focus for the panel discussion. To summarize, the par

- Kent Blumenthal; Assistant to the Deputy Ex
  Director, National Parks and Recreation Associat

- Laura Boggess; Health Statistician, Health Status Measurement, National Center for Health Statistics
- Ray Ciszek; Executive Director, Association for Research, Administration, Professional Councils and Societies, American Alliance for Health, Physical Education, Recreation and Dance
- Art Curtis; Vice President, Institute for Human Performance (Consultant to Macro Systems)
- Tom Drury; Branch Chief, Health Status Measurement, National Center for Health Statistics
- Ramon Garcia; Supervising Social Science Research Analyst, Office of Human Development Services
- Glen Gilbert; Coordinator of School Health Programs, Office of Disease Prevention and Health Promotion
- Lloyd Kolbe; Chief, Evaluation Section, Office of Disease Prevention and Health Promotion
- Chuck Lupton; Senior Research Associate, The Granville Corporation
- Jeffrey Newman; Medical Epidemiologist, Center for Health Promotion and Education, Centers for Disease Control
- Nancy Ostrove; Senior Research Associate, The Granville Corporation
- Jim Ross; Senior Associate, Macro Systems
- Glen Swengros; Director, Federal-State Relations, President's Council on Physical Fitness and Sports.

PANEL APPROACH AND INITIAL CONCERNS

Subsequent to introduction of the participants and explanation and clarification of both the objective of the present meeting and the results of previous meetings, some general concerns were aired. These resulted in further clarification by the Macro Systems representatives regarding the scope of the project in which the instruments were to be used, the anticipated response burden on the schools, and the assurance that the study would not allow comparisons to be made between schools, since the sampling procedure utilized would restrict the number of students within each school that

participated in the study. In addition, strong concern was voiced that both instructions and questions be read to the students—i.e., that reliance not be placed on students' reading ability.

The group agreed with the proposed process of treating the draft instrument provided by The Granville Corporation as a focus for discussion. The general arrangement of the draft instrument, that is, its division into three topics of general inquiry about the sources of activity—school physical education programs, public recreation/community programs, and those performed on one's own or unofficially organized—was dictated by the wording of the contract objectives and an analysis of the Objectives for the Nation for 1990, the document which serves as the basis for the related survey effort.

Conceptualization and Format Issues

In general, the issues raised fell into two categories; they were either conceptual or logistical. The most significant conceptual issue remained unresolved at the close of the session; it concerned the minimal set of information necessary to fulfill the aims stated in both the present contract for the questionnaire construction and the associated survey contract. Tentative resolution of this issue was achieved the following day, during a meeting of a four-person subset of the group, and was reviewed by most of the absent members of the panel prior to being finalized. In essence, clarification was needed regarding:

- the necessity of dichotomizing school physical education programs into physical education class activities and all other extracurricular physical activities
- the classification of public versus private sources of community funding.

Review of the Objectives for the Nation, as well as the purposes specified in the contract with Macro Systems to conduct the assessment of the physical fitness status and activity patterns of schoolchildren and youth, indicated that:

- the school physical education class/extracurricular activity dichotomy was necessary

- the public/private dichotomization regarding funding sources for public recreation programs in community facilities was desirable. However, it was admitted that children would be unlikely to know what private agency of the many extant was the funding source for any particular program.

The major logistical issue concerned the formatting of the questions about specific activities pursued by the respondents. In lieu of making an arbitrary decision, since each of the three formats suggested had both advantages and disadvantages, it was decided that all three formats would be presented and that the contractor using the instrument would make the final decision--presumably based upon informal pre-testing--with input from the Project Officer. In addition, because the specific activity questions are relevant for each of the four generic source areas finally identified--i.e., school-in class, school-extracurricular, public recreation, and self-initiated (including private groups/organizations)--the format options will be presented in a section separate from the discussion of items specific to each source category.

REVIEW PROCESS

Unfortunately, only limited time was available for the panel members to review the draft write-up before its preparation in final form. An added complication was the extended absence of two of the panel members. Nonetheless, specific comments from the panel members who were reached for at least partial review (N=7; the Macro representatives declined to provide a review but are providing a pre-[illegible]st report to the Project Officer) have been incorporated into this report in the relevant sections, and specific changes made to the appropriate questionnaire items.

However, some useful comments were also made which were more general in orientation. For example, two individuals expressed their concern about the limitations of the study in which the questionnaire is to be used. One felt it would provide at best a good pilot investigation; the other expressed considerable concern about the capacity of anyone, and especially of children, to recall accurately detailed information about their activities over the course of a year. Given information from previous similar studies with adults (Reiff, Montoye, Remington, Napier, Metzner, and Epstein, 1967), this is not an unrealistic concern. In addition, one of the individuals felt that em-

phasis should be placed on the presentation of the questionnaire, specifically citing the need to utilize visual aids (e.g., calendars, pictures) to provide clarification of especially difficult concepts.

Panel members were requested to rank the questionnaire items with regard to how important it was to include them. However, the small number of actual rankings obtained (N=2) and the general lack of consensus indicated lowers the overall value of the results. They were also asked to provide some indication of how they felt about the format options provided; these results are discussed in a general fashion under the topic heading of Assessment of Specific Activities. They are also delineated more exactly in Appendix A along with the description of the options themselves. It should be noted here, however, that the format options offered had conceptual as well as logistical implications, and that not all of the panel members seemed to agree with the decision made concerning the need to collect specific activity information for each of the source categories.

Presentation of the issues discussed, related decisions made by the panel, and reviewers' comments are treated in the following order.

- Public recreation/community programs
- School physical education programs—in class and extracurricular
- Physical activities done with friends or family or on one's own
- Assessment of specific activities.

The resultant questionnaire items are included in Appendix A.

PUBLIC RECREATION/COMMUNITY PROGRAMS

The major issue which arose specific to this section dealt with the conceptual distinction between community activities sponsored by public recreation monies as opposed to those sponsored by private organizations. In the original conceptualization of the draft questionnaire, these two types of sponsors were dealt with in the same section; i.e., questions about individual activity patterns in community facilities were not broken down as a function of sponsorship. The conclusion reached by the group, largely as a function of

a relatively strict interpretation of the intent indicated in the relevant Objectives for the Nation for physical fitness and exercise, was that these two sources of resource allocation for community activities needed to be treated separately.

In addition, the individuals participating in the smaller meeting the next day concluded that participation in programs funded by private sources should be assessed along with activities individuals engage in on a non-organized basis—the third category listed above. Examples of private sources/organizations include:

- YMCA/YWCA or YMHA/YWHA
- Church, temple or other religious group
- Boy or girl scouting organizations
- Parent's employer
- Other private clubs/organizations
  - — Boys and Girls Clubs
  - — Private Sports Clubs
  - — Gyms
  - — Health Clubs.

The questionnaire item itself is included in Section 3 of the questionnaire (Appendix A).

Finally, it should be noted that the wording of the section was changed to "PUBLIC RECREATION PROGRAMS", and that additional descriptive information was added to clarify further the type of sponsorship involved (see Section 2, Appendix A).

SCHOOL PHYSICAL EDUCATION PROGRAMS—IN CLASS AND EXTRACURRICULAR

As noted previously, the major concern regarding the assessment of participation in school programs was with the need to dichotomize individual activity patterns in the school as a function of whether the activity took place in physical education classes scheduled during the school day or within some other context—e.g., in intramural, interscholastic teams, clubs, at recess, before school, etc. This distinction therefore constituted two of the four source categories ultimately decided upon.

Other discussion focused around the time period (term or school year) to be addressed, and the kinds of actions (e.g., showering, changing, taking attendance) which should be excluded from a judgment regarding the length of the regular physical education class period. One of the panel members commented during the review process that some schools use the "quarter" classification rather than "term" to describe the school year segmentation. Therefore, this categorization is included interchangeably with "term." However, since it is possible that different time segments are being described by the varying terminology, we suggest investigation of this potential difference prior to actual testing. The results of these discussions are the items included in Section 1 of Appendix A.

PHYSICAL ACTIVITIES DONE WITH FRIENDS OR FAMILY OR ON ONE'S OWN

As described previously, the main result of the discussion was to include within this set of questions activities performed by the individual in privately sponsored community programs as well as those performed under non-organized circumstances. This inclusion expanded the original intent of this section to deal solely with activities performed by the individual either alone or with family or friends in a relatively non-organized manner.

Review of this section also resulted in a number of formatting changes meant to increase the consistency of questionnaire items throughout the instrument. The items resulting from the discussion of this part of the instrument are in Section 3 of Appendix A.

ASSESSMENT OF SPECIFIC ACTIVITIES

Questions about participation in specific activities--that is, about participation in, e.g., basketball, running, tennis, etc.--are ubiquitous in this instrument. Originally, these questions were presented in a duplicative fashion in each of the three original source breakdowns provided. However, consideration of the need to dichotomize the school participation category, and to reconceptualize the public recreation category, in conjunction with concerns about the length and clarity of the questionnaire, led to an extended discussion about how best to treat the presentation of these questions. As

noted previously, because of the lack of consensus on this issue, the three formats discussed will be presented separately. Other input by the panel members included:

- the addition of overlooked activities
- modification/clarification of questions concerning
  - frequency (as a function of days per week)
  - duration (in minutes) of each instance of the activity
  - intensity of the activity performance
  - penetration of the activity throughout the year (seasonality).

The results of the discussions regarding activities are presented in section 4 of Appendix A.

Some further issues however should be mentioned here. One issue concerned the kind of information necessary to make inferences about the cardio-respiratory value of different activities. Since there is in fact expert opinion regarding the manner in which an activity must be performed in order for it to have the so-called "training effect", ideally we should be able to measure the components so identified. Two components present no problem. The requirement that the activity must be performed for at least 20 minutes at a time for three times a week can be assessed given the items included—i.e., duration and frequency. However, the third important component—that the activity be performed at an intensity sufficient to keep the heart beating within a specified target range—cannot easily be measured by self-report to begin with, and was not included as a variable in the draft questionnaire.

Although the full panel agreed that a measure of intensity of the activity was probably not feasible, the members of the smaller group felt that an attempt to make an assessment would be worthwhile, especially if pre-tests were to be carried out before finalizing the instrument. Therefore, a very crude measure of intensity was included which requests that the respondent specify whether or not s/he sweats during performance of the activity. The use of an even more refined measure asking about both heavy breathing and experience of perspiration in a trichotomized format was considered to be too demanding, especially for the younger children. On the other hand, later review, however limited, indicated little agreement with the use of sweating as

an indicator of intensity. Suggestions were made to utilize hard breathing, or perception of rapid heart beat instead. Given the variety of sweating responses, and the influence of humidity and sex differences on perceptions, this seemed to be a reasonable observation; the item consequently was altered to reflect the perception of either heavy breathing or rapid heart beat, remaining, however, in a dichtomized (yes-no) format.

A further issue relevant to assessment of individual activity patterns concerned that of "penetration," or seasonality--i.e., for what segment of the year does the respondent perform the activity in question. The issue is relevant both to format and overall methodology. Specifically, although it is always preferable to get information in as detailed a form as possible, sometimes logistical considerations dictate obtaining cruder measures. Therefore, it was recommended by the group that penetration--in months--be assessed utilizing a check-off system where the actual months during which the activity takes place can be identified. However, should space and response burden considerations prove excessive, an acceptable alternative offered was that the respondent could simply indicate the total number of months he or she engages in the particular activity over the course of the year.

A third issue revolved around the thoroughness of the listing of activities, especially in relation to those performed in schools--e.g., dodge ball, kickball, punch ball--which can vary as a function of both region and grade. Any attempt to include an exhaustive list of activities is thus doomed to failure. Given this assumption, our recommendation is that the individual who administers the questionnaire clearly emphasize the importance of using the "OTHER (SPECIFY)" category for as many activities as are relevant. In fact, the administrator should be urged to give common examples of missing activities, such as the ones listed above.

A fourth issue aired in the smaller group meeting concerned the nature of activities performed in school physical education classes. Specifically, it was noted that many activities that children perform in class take place for a relatively short period of time--e.g., six weeks or so--which serves to make the activities performed in this context conceptually different from those performed in other contexts and suggests the value of collecting somewhat altered measures. Again, since no clear resolution was reached regarding this issue, it is offered as another format alternative in section 4

of Appendix A. As noted there, a number of reviewers indicated a favorable attitude toward use of this option.

Finally, as mentioned previously, the issue concerning the amount of detail necessary to fulfill the requirements of the contract objectives with regard to the sources of the activities remained unresolved at the end of the first meeting, was tentatively resolved by the finish of the second meeting, but received mixed input during the review process. Specifically, two reviewers (one not a member of the panel itself) indicated a preference for Major Option 3. That option does not allow for the collection of specific activity data as a function of the four source breakdowns (school-in class, school-extracurricular, public recreation programs, on one's own). Also, one other reviewer constructed his own option. He wanted to see use of Major Option 1 for school-in class activities only, and use of Major Option 3--with particular encouragement given to the use of the "OTHER (SPECIFY)" category--for the other three source categories. Clearly then, not all of the panel members agree with the advisability of collecting specific activity information as a function of source categorization--despite the conclusions reached by the second group meeting based on stated study objectives.

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APPENDIX A

DRAFT QUESTIONNAIRE

INSTRUCTIONS: People are involved in all kinds of activities as they go through each day. They eat, go to school or work, watch television and read. Also, they spend time with their friends and play in the playground, in parks and around their homes. What you do during your day is all part of your pattern of physical activity.

We would like you to answer some questions about what you do. We are especially interested in your physical activity patterns. We need you to be as accurate and as honest as you can about how you spend your time. We don't have any specific answers in mind. Any answer you give is the right one as long as it's the true one.

For each of the questions below, you will be told what to do to answer it. If you're not sure how to answer any question, tell the person who gave you the questionnaire.

SECTION 1: SCHOOL PHYSICAL EDUCATION PROGRAMS--IN CLASS AND EXTRACURRICULAR

We would like to ask you about some of the things that you do in school. Some of these you may do in your physical education class. Others you may do after school, like playing on school teams, or during your lunch or recess.

1.1 How many days each week does your physical education (phys ed) class meet this term/quarter? (Check one)

EVERY DAY	___	
4 TIMES A WEEK	___	
3 TIMES A WEEK	___	
2 TIMES A WEEK	___	
1 TIME A WEEK	___	
I'M NOT IN A PHYS ED CLASS THIS TERM/QUARTER	___	(SKIP TO QUESTION 1.2)

1.1a. How long is your phys ed class this term/quarter, <u>not counting</u> time for changing, showers, and taking attendance? (Check one)

LESS THAN A HALF HOUR	___
30-45 MINUTES	___
46-60 MINUTES	___

1.1b. Please check below how much you have missed phys ed class this term/quarter because of illness or for any other reason. (Check one)

HAVE MISSED LESS THAN 5 DAYS	___
HAVE MISSED 5 DAYS	___
HAVE MISSED 10 DAYS	___
HAVE MISSED 15 DAYS	___
HAVE MISSED 20 DAYS OR MORE	___

1.2 How many days each week did your physical education (phys ed) class meet <u>last</u> term/quarter? (Check one)

5 TIMES A WEEK	___
4 TIMES A WEEK	___
3 TIMES A WEEK	___
2 TIMES A WEEK	___
1 TIME A WEEK	___
I WAS NOT IN A PHYS ED CLASS LAST TERM/QUARTER	___

1.3 Besides, or instead of, a phys ed class, is there a special time, for example, recess, for the class members to exercise, play or run around in a yard or other large open area? (Check one)

NO ____ (SKIP TO QUESTION 1.4)
YES ____

1.3a. What kinds of things do you do during this time?

_____

_____

_____

1.4 Besides, or instead of, a phys ed class, are there regular activity breaks held during class when you do calisthenics, stretching or other exercises in your classroom? (Check one)

NO ____
YES ____

The form that remaining items take will depend on the decisions made about the format of the individual activity questions. In essence, they will deal with:

- activities performed in physical education classes
- school-sponsored activities performed under circumstances other than phys ed classes--e.g., intramural, interscholastic teams or clubs, during recess or before classes begin.

In addition, it is only in the case of Option 1 being chosen that these items will be included with the preceding items.

SECTION 2: PUBLIC RECREATION PROGRAMS

This section will only be included should Option 1 be chosen. In the event that Options 2 or 3 are chosen, the following description may be used to enable the respondent to classify his activities regarding sponsorship.

2.1 We would like you to tell us a little about sports or other activities you do that are sponsored by your local public recreation or parks department. You might do these activities in a local community center, or a park, or a local school building, or even at your own school in the summer or on weekends. You might even do these activities as a student in a class, but it won't be during the school day.

(SEE SECTION 4 FOR OPTION 1 FORMAT)

SECTION 3: ACTIVITIES DONE WITH FRIENDS OR FAMILY OR ON ONE'S OWN

People take part in sports, exercises, and other physical activities with their family and their friends and by themselves. We have already asked you about the things you do at school and as part of public recreation programs. Some of those activities you do with your friends (at schools) or your friends or family (at community centers and parks). Now we would like you to answer some questions about your activities that you do that <u>are not connected</u> with your school or with public recreation programs. Again, however, you may do these things either alone, with your family or with friends.

3.1 Are there other things you do which require <u>a lot of</u> physical activity--for example, summer camp counselor, stockroom clerk, vigorous yard or house chores, farm work, dance instructor, etc)? (Check one)

NO ____ (SKIP TO QUESTION 3.2)
YES ____

3.1a. What months out of the year do you do these things? (Check all that apply)

____ JAN	____ APR	____ JULY	____ OCT
____ FEB	____ MAY	____ AUG	____ NOV
____ MAR	____ JUNE	____ SEPT	____ DEC

3.1b. About how many days per week do you work at these activities? (Circle one)

1 2 3 4 5 6 7

3.1c. About how many hours do you work each week at these activities?

____ HOURS PER WEEK

3.2 Do you take part in any sports or other physical activities sponsored by any of the groups or organizations listed here? (Circle either YES or NO for <u>each</u> of the groups)

YMCA/YWCA OR YMHA/YWHA	YES	NO
CHURCH, TEMPLE OR OTHER RELIGIOUS GROUP	YES	NO
PRIVATE ORGANIZATION (HEALTH CLUB, GYM, PRIVATE SPORT CLUB, BOYS OR GIRLS CLUB, ETC.)	YES	NO
BOY OR GIRL SCOUTING ORGANIZATION (INCLUDING BLUEBIRDS, CAMPFIRE GIRLS, ETC.)	YES	NO
PARENT'S EMPLOYER	YES	NO
OTHER (SPECIFY) _____	YES	NO

3.3 During the 1981-82 school year, were you more, less or equally as physically active as you are present?

MUCH MORE PHYSICALLY ACTIVE	___
SOMEWHAT MORE PHYSICALLY ACTIVE	___
ABOUT AS PHYSICALLY ACTIVE	___
SOMEWHAT LESS PHYSICALLY ACTIVE	___
MUCH LESS PHYSICALLY ACTIVE	___

SECTION 4: ASSESSMENT OF SPECIFIC ACTIVITIES

Because of the number of format options considered acceptable for assessment of participation in specific activities, they are not presented here in their final, complete form. Instead, each of the three major options is explained and examples sufficient to describe each graphically are presented. Also, the sub-option of whether to treat activities taking place in school phys ed classes differently from the remaining three generic breakdowns is described, and its applicability to each major option specified.

In addition, a listing of all the specific activities to be assessed, regardless of the major option chosen, as well as the information to be collected about each activity, is presented at the forefront of this section.

Activities

ARCHERY
BADMINTON
BASEBALL/SOFTBALL
BASKETBALL
BICYCLING
BOWLING
BOXING
CALISTHENICS
CANOEING/ROWING
CLIMBING
DANCING-VIGOROUS
FENCING
FOOTBALL
GOLF
GYMNASTICS (TUMBLING)
GYMNASTICS (APPARATUS
HANDBALL
HIKING/BACKPACKING
HOCKEY (ICE OR FIELD)
JUMPING ROPE
LACROSSE
MARTIAL ARTS (E.G., JUDO, KARATE)
RACQUETBALL
RUNNING SPRINGS
RUNNING/JOGGING-DISTANCE
SCUBA DIVING
SKATING (ICE OR ROLLER)
SKIING-DOWNHILL
SKIING-CROSS COUNTRY
SOCCER
SQUASH
SWIMMING
TABLE TENNIS
TENNIS
TRACK AND FIELD (EVENTS OTHER THAN RUNNING)
VOLLEYBALL
WALKING QUICKLY (FOR AT LEAST 15 MINUTES)
WEIGHTLIFTING/WEIGHT TRAINING
WRESTLING
YOGA
OTHER (SPECIFY) _____

Information Collected about Activities

Frequency

How many days a week do you take part in this activity? (Circle one)

LESS THAN 1	4
1	5
2	6
3	7

Duration

For how many minutes do you do this activity each time you take part in it? (Check one)

LESS THAN 20 MINUTES ____
20-39 MINUTES ____
40-60 MINUTES ____
OVER 60 MINUTES ____

Intensity

Does your heart beat rapidly or do you breathe hard when you do this activity? (Check one)

NO ____
YES ____

Penetration

Preferred Format

What months out of the year are you involved in this activity? (Check all that apply)

____ JAN	____ APR	____ JULY	____ OCT
____ FEB	____ MAY	____ AUG	____ NOV
____ MAR	____ JUNE	____ SEPT	____ DEC

Alternative Format

How many months of the year are you involved in this activity?

____ MONTHS PER YEAR

Major Option 1

Utilizing this option would entail asking the respondent to select up to ten activities s/he most often engages in, for each of the four generic sponsorship categories (school phys ed class, school extracurricular program, public recreation program, other activities) from a reference listing provided. The listing could be either on a reference card or at the top of each page. After writing the name of the activity in the space provided, the respondent would answer each of the questions about the activity--i.e., frequency, duration, penetration, and intensity. An example of what this would look like is presented in Exhibit 2.

Two of the panel members indicated their preference for this option to be used along with the School Phys Ed sub-option described later.

Major Option 2

Utilization of this option would entail having the respondent make an initial determination of whether s/he performs the activity specified in the context of any of the four generic sponsorship categories. In other words, the activity itself forms the first decision point--is it performed or not? The second decision consists of which of the sponsorship categories are relevant--from one to four could be relevant. Finally, for each relevant sponsorship category, the questions of frequency, duration, etc. are asked. This option is presented graphically in Exhibit 3.

Three of the panel members indicated their preference for this option, to be used along with the School Phys Ed sub-option described later.

EXHIBIT 2

MAJOR OPTION 1

SCHOOL EXTRACURRICULAR ACTIVITIES EXAMPLE

ACTIVITIES

Archery
Badminton
Baseball/Softball
Basketball
Bicycling
Bowling
Boxing
Calisthenics
Canoeing/Rowing
Climbing
Dancing-Vigorous
Fencing
Football
Golf
Gymnastics (Tumbling)
Gymnastics (Apparatus)
Handball
Hiking/Backpacking
Hockey (ice or field)
Jumping rope
Lacrosse
Martial Arts (e.g.,karate)
Racquetball
Running sprints
Running/Jogging-distance
Scuba Diving
Skating (ice or roller)
Skiing--Downhill
Skiing--cross country
Soccer
Squash
Swimming
Tennis
Track and Field (events other than running)
Volleyball
Walking quickly (for at least 15 min.)
Weightlifting/weight training
Wrestling
Yoga
Other (specify) _____
Other (specify) _____

What we would like you to do here is to read over the list of activities above and select those you have done most often this past year in school programs that are not part of your regular physical education class. This may include intramural or inter-scholastic teams or activity clubs, or activities you take part in during recess or before classes begin for the day. Remember, do not chose an activity because you do it in class. We only want your non-regular-school class activities.

Once you have chosen these activities (no more than 15),write their names in the spaces below (one activity goes in each space). Then answer the questions in the columns to the right for each activity.

A. How many days a week do you take part in this activity? (Circle one)
B. For how many minutes do you usually do this activity each time you take part in it? (Circle one)
C. Does your heart beat rapidly or do you breathe hard when you do this activity? (Circle YES or NO)
D. What months out of the year are you involved in this activity? (Circle all that apply)

ACTIVITY	A. HOW MANY DAYS PER WEEK? (circle one)	B. HOW MANY MINUTES EACH TIME? (circle one)	C. RAPID HEART BEAT OR HARD BREATHING? (circle one)	D. WHAT MONTHS? (Circle all that apply)
1.	<1 1 2 3 4 5 6 7	<20 20-39 40-60 over 60	YES NO	Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec
2.	<1 1 2 3 4 5 6 7	<20 20-39 40-60 over 60	YES NO	Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec

BEST COPY AVAILABLE

EXHIBIT 3

MAJOR OPTION 2

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On this page and the pages following, we have listed in large letters a number of different activities you may take part in. Directly below the name of the activity are four categories which represent the following descriptions.

School Physical Education Class--This refers to whether you do this activity in your school physical education class.
School Extra-curricular Programs--This refers to whether you do this activity in your school before or after school hours. It may include your being on intramural or interscholastic teams, or in activity clubs, or activities you do during recess or before classes start for the day.
Publication Recreation Programs--This refers to whether you do this activity in a program sponsored by your local public recreation or parks department. It may take place in a local community center, in a park or local school building, or even at your own school in the summer, on weekends, or in the evening.
Non-organized Activities--This refers to activities you do around your home or in parks or playgrounds that are not sponsored by your school or by a public recreation program. You may do this activity alone, or with your family or friends.

We would like you to put a check on the line next to the categories that describe where the activity takes place. You might check none of these if you never perform the activity, or you might check one of the categories, or two, or even three or four.

For example, if you play basketball in your physical education class, and were on the basketball team at school, and played basketball with your family on weekends, you would check the appropriate three of the four categories--all except the public recreation program category.

After you do this, we would like you to answer these questions in the columns to the right for each of the categories you checked.

A. How many days a week do you take part in this activity? (Circle one)
B. For how many minutes do you usually do this activity each time you take part in it? (Circle one)
C. Does your heart beat rapidly or do you breathe hard when you do this activity? (Circle YES or NO)
D. What months out of the year are you involved in this activity? (Circle all that apply)

ACTIVITY	A. HOW MANY DAYS PER WEEK? (circle one)	B. HOW MANY MINUTES EACH TIME? (circle one)	C. RAPID HEART BEAT OR HARD BREATHING? (circle one)	D. WHAT MONTHS? (Circle all that apply)
BADMINTON				
__School Physical Education Class	<1 1 2 3 4 5 6 7	<20 20-39 40-60 over 60	YES NO	Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec
__School Extracurricular Programs	<1 1 2 3 4 5 6 7	<20 20-39 40-60 over 60	YES NO	Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec
__Public Recreation Programs	<1 1 2 3 4 5 6 7	<20 20-39 40-60 over 60	YES NO	Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec
__Non-organized Activities	<1 1 2 3 4 5 6 7	<20 20-39 40-60 over 60	YES NO	Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec

BEST COPY

Major Option 3

This option has conceptual as well as format implications. It was first suggested in the original meeting as a more compact way of dealing with the large amount of information being asked for. However, it does not allow a breakdown of information about participation in specific activities as a function of sponsorship category. Therefore, the tentative decisions concerning the need for this breakdown made by the following day's smaller group meeting would seem to lower the attractiveness of this option.

Nonetheless, in the interest of providing as complete a picture as possible of the panel process, this option is graphically presented in Exhibit 4. It can be seen that this option differs from Option 1 in two ways. Instead of providing a reference card or list of activities, all of the activities are listed down the left side of the page. Also, an additional question concerning sponsorship is added to the standard four questions of frequency, duration, penetration and intensity.

As discussed previously, one panel member (and one outside reviewer) expressed their preference for this option as it stands. One other member felt this option should be used for all source categories except School Phys Ed classes-which should be assessed via Option 1.

School Phys Ed Class Sub-Option

During the course of the second, smaller group meeting, it was noted that the many and varied activities pursued during the course of a school physical education class do not necessarily lend themselves to easy classification into months performed. In addition, if one assumes that one major activity is carried on in each class, then both frequency and duration infor-

EXHIBIT 4

MAJOR OPTION 3

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Down the left side of the page is a list of activities that people can do. We would like you to read these activities and put a check to the left of those you do. Then, for each activity you checked answer each one of the following questions.

A. How many days a week do you do the activity? (Circle one)
B. For how many minutes do you usually do the activity each time? (Circle one)
C. Does your heart beat rapidly or do you breathe hard when you do the activity? (Circle one)
D. What months out of the year are you involved in this activity? (Circle all that apply)
E. What is the source of the activity? Do you do it in your school phys ed class, during an after or before-hours school program, as part of a public recreation or parks program, or on your own? Doing it on your own would include your doing it as part of a private organization--for example, YMCA, private sport club, health club, etc. (Circle all that apply)

ACTIVITY	DAYS PER WEEK	MINUTES EACH TIME	RAPID HEART BEAT OR HARD BREATHING	WHICH MONTHS	SOURCE OF ACTIVITY
___ BADMINTON	<1 1 2 3 4 5 6 7	<20 20-39 40-60 >60	Yes No	Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec	School-Class Extra-Curricular Pub. Rec. Program On My Own
___ BASEBALL/SOFTBALL	<1 1 2 3 4 5 6 7	<20 20-39 40-60 >60	Yes No	Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec	School-Class Extra-Curricular Pub. Rec. Program On My Own
___ BASKETBALL	<1 1 2 3 4 5 6 7	<20 20-39 40-60 >60	Yes No	Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec	School-Class Extra-Curricular Pub. Rec. Program On My Own
___ BICYCLING	<1 1 2 3 4 5 6 7	<20 20-39 40-60 >60	Yes No	Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec	School-Class Extra-Curricular Pub. Rec. Program On My Own

mation already will have been obtained by the respondent's answers to questions 1.1a and 1.1b. Therefore, the suggestion was made that the questions concerning participation in specific activities be abbreviated and disassociated from the activity questions associated with the other three sponsorship categories.

The format suggested would be a matrix-type with all the possible activities listed down the left side of the page and the respondents asked to indicate whether they have done the activity within their current phys ed class, and if so, how intensely they perform it, and for how many weeks. The item is presented in Exhibit 5. Inclusion of this item would have similar effects on all the major options described above.

Five panel members indicated their preference for use of this suboption.

EXHIBIT 5

SCHOOL PHYS ED SUB-OPTION

1.1c We would like you to tell us here what kinds of activities you do in your school phys ed class. For each of the activities listed below, check those which you've done in your class this term/quarter. Then, only for those you've checked, circle the number of weeks you did the activity and whether you usually breathe hard or feel your heart beating rapidly when you do the activity.

ACTIVITY	CHECK HERE IF YOU HAVE DONE THE ACTIVITY THIS TERM/QUARTER	NUMBER OF WEEKS	RAPID HEART BEAT OR HARD BREATHING (CHECK ONE)	
ARCHERY	_____	1 2 3 4 5 6 7 8	YES	NO
BADMINTON	_____	1 2 3 4 5 6 7 8	YES	NO
BASEBALL/SOFTBALL	_____	1 2 3 4 5 6 7 8	YES	NO
BASKETBALL	_____	1 2 3 4 5 6 7 8	YES	NO
BICYCLING	_____	1 2 3 4 5 6 7 8	YES	NO
BOWLING	_____	1 2 3 4 5 6 7 8	YES	NO
BOXING	_____	1 2 3 4 5 6 7 8	YES	NO
CALISTHENICS	_____	1 2 3 4 5 6 7 8	YES	NO
CANOEING/ROWING	_____	1 2 3 4 5 6 7 8	YES	NO
CLIMBING	_____	1 2 3 4 5 6 7 8	YES	NO
DANCING-VIGOROUS	_____	1 2 3 4 5 6 7 8	YES	NO
FENCING	_____	1 2 3 4 5 6 7 8	YES	NO
FOOTBALL	_____	1 2 3 4 5 6 7 8	YES	NO
GOLF	_____	1 2 3 4 5 6 7 8	YES	NO
GYMNASTICS (TUMBLING)	_____	1 2 3 4 5 6 7 8	YES	NO
GYMNASTICS (APPARATUS)	_____	1 2 3 4 5 6 7 8	YES	NO
HANDBALL	_____	1 2 3 4 5 6 7 8	YES	NO
HIKING/BACKPACKING	_____	1 2 3 4 5 6 7 8	YES	NO
HOCKEY (ICE OR FIELD)	_____	1 2 3 4 5 6 7 8	YES	NO
JUMPING ROPE	_____	1 2 3 4 5 6 7 8	YES	NO
LACROSSE	_____	1 2 3 4 5 6 7 8	YES	NO
MARTIAL ARTS (E.G., JUDO, KARATE)	_____	1 2 3 4 5 6 7 8	YES	NO
RACQUETBALL	_____	1 2 3 4 5 6 7 8	YES	NO
RUNNING SPRINTS	_____	1 2 3 4 5 6 7 8	YES	NO
RUNNING/JOGGING-DISTANCE	_____	1 2 3 4 5 6 7 8	YES	NO

EXHIBIT 5

SCHOOL PHYS ED SUB-OPTION
(continued)

	CHECK HERE IF YOU HAVE DONE THE ACTIVITY THIS TERM/QUARTER	NUMBER OF WEEKS	RAPID HEART BEAT OR HARD BREATHING (CHECK ONE)	
SCUBA DIVING	_____	1 2 3 4 5 6 7 8	YES	NO
SKATING (ICE OR ROLLER)	_____	1 2 3 4 5 6 7 8	YES	NO
SKIING-DOWNHILL	_____	1 2 3 4 5 6 7 8	YES	NO
SKIING-CROSS COUNTRY	_____	1 2 3 4 5 6 7 8	YES	NO
SOCCER	_____	1 2 3 4 5 6 7 8	YES	NO
SQUASH	_____	1 2 3 4 5 6 7 8	YES	NO
SWIMMING	_____	1 2 3 4 5 6 7 8	YES	NO
TABLE TENNIS	_____	1 2 3 4 5 6 7 8	YES	NO
TENNIS	_____	1 2 3 4 5 6 7 8	YES	NO
TRACK AND FIELD (EVENTS OTHER THAN RUNNING)	_____	1 2 3 4 5 6 7 8	YES	NO
VOLLEYBALL	_____	1 2 3 4 5 6 7 8	YES	NO
WALKING QUICKLY (FOR AT LEAST 15 MINUTES)	_____	1 2 3 4 5 6 7 8	YES	NO